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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,889	02/04/2004	Mikko Rinne	037145-0701	3881

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EXAMINER

BALAOING, ARIEL A

ART UNIT	PAPER NUMBER
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2617

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/771,889	Applicant(s) RINNE ET AL.	
	Examiner Ariel Balaoing	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

Response to Arguments

2. Applicant's arguments with respect to claim 1-13, 15-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 3-7, 9-13, 16-18, 20-23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCGOVERN et al (US 2002/0142777 A1) in view of DENT (US 5,668,637).

Regarding claim 1, MCGOVERN discloses a method for decreasing required radio spectrum in a communication system using variable bandwidth, the method comprising: dividing radio frequencies of the communication system into a wideband channel radio frequency and narrowband channel radio frequencies (paragraph 11, 12); and communicating user data using both the wideband channel radio frequency and the narrowband channel radio frequencies (paragraph 11, 12, 21, 27, 28). However, MCGOVERN does not expressly disclose wherein the narrowband channel radio frequencies are used for communicating user data when a device involved in the communication is located in cell boundary regions. DENT discloses wherein the narrowband channel radio frequencies are used for communicating user data when a

device involved in the communication is located in cell boundary regions (col. 8, line 7-28; col. 9, line 9-40). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify MCGOVERN to include the use of narrowband frequencies when a device communication is located in cell boundary regions, as taught by DENT, since DENT state col. 9, line 31-40 that such a modification would improve soft handover in a mobile communication setting.

Regarding claim 3, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein at least in some cells of the communication system both the narrowband channel radio frequencies and the wideband channel radio frequency are allocated so that the narrowband channel radio frequencies are used to extend cell range (paragraph 22, 23).

Regarding claim 4, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband channel radio frequencies are divided among adjacent communication cells in such a way that adjacent cells are using different narrowband channel radio frequencies (paragraph 22, 23).

Regarding claim 5, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband channel radio frequencies are located outside the wideband channel (paragraph 13; wideband and narrowband channels are provided using the entire bandwidth available, with wideband and narrowband channels available together).

Regarding claim 6, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband channel multiple access method incorporates spreading as a means to implement spectrum sharing between adjacent cells (paragraph 3, 13, 22, 23).

Regarding claim 7, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband channel radio frequencies are located inside the wideband channel radio frequency (paragraph 13, 22).

Regarding claim 9, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses further comprising transmission of communication scheduling information using a narrowband channel radio frequency (paragraph 20-22).

Regarding claim 10, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein scheduling information includes terminal identity for a terminal that will use a channel (paragraph 20-22).

Regarding claim 11, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein use of the wideband channel radio frequency is coordinated (paragraph 21-23).

Regarding claim 12, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the

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narrowband channel radio frequencies are assigned to different communication cells (paragraph 22-23).

Regarding claim 13, MCGOVERN further discloses a wireless communication system using variable bandwidth to increase re-use of frequency channels in the wireless communication system, the system comprising: a mobile station having a receiver and a transmitter (paragraph 17), the receiver and transmitter being configured to adaptively sample frequency and bandwidth (paragraph 27); and a base station having a receiver and a transmitter, the receiver and transmitter being configured to adaptively sample frequency and bandwidth (paragraph 21, 22), wherein communication between the mobile station and the base station occurs utilizing at least two different frequency carrier bandwidths: narrowband and wideband (paragraph 14, 15). However, MCGOVERN does not expressly disclose wherein narrowband frequency carrier bandwidths are used in communication between the mobile station and the base station when the mobile station is located in the vicinity of a cell boundary. DENT discloses wherein narrowband frequency carrier bandwidths are used in communication between the mobile station and the base station when the mobile station is located in the vicinity of a cell boundary (col. 8, line 7-28; col. 9, line 9-40). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify MCGOVERN to include the use of narrowband frequencies when a device communication is located in cell boundary regions, as taught by DENT, since DENT state col. 9, line 31-40 that such a modification would improve soft handover in a mobile communication setting.

Regarding claim 16, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carriers are outside a full bandwidth channel (paragraph 13; wideband and narrowband channels are provided using the entire bandwidth available, with wideband and narrowband channels available together).

Regarding claim 17, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carrier or narrowband carriers outside the full bandwidth channel implement spreading (paragraph 3, 13, 22, 23).

Regarding claim 18, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carriers are inside a full bandwidth channel (paragraph 13, 22).

Regarding claim 20, MCGOVERN discloses a device (102-Figure 1) operable in a wireless communication environment and configured to utilize variable bandwidth, the device comprising: a radio interface configured to communicate with base stations (104, 106-Figure 1) in a wireless communication environment (paragraph 21-23); and a processor (108-Figure 1) coupled to the radio interface, the processor providing commands to modulate at least two transmission and receive bandwidths: wideband and narrowband (paragraph 22-23). However, MCGOVERN does not expressly disclose wherein the wireless communication environment implements narrowband bandwidth for communication when the device is in cell boundary regions. DENT discloses wherein the wireless communication environment implements narrowband

bandwidth for communication when the device is in cell boundary regions (col. 8, line 7-28; col. 9, line 9-40). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify MCGOVERN to include the use of narrowband frequencies when a device communication is located in cell boundary regions, as taught by DENT, since DENT state col. 9, line 31-40 that such a modification would improve soft handover in a mobile communication setting.

Regarding claim 21, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carriers are inside a full bandwidth channel (paragraph 13; wideband and narrowband channels are provided using the entire bandwidth available, with wideband and narrowband channels available together).

Regarding claim 22, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carriers are outside a full bandwidth channel (paragraph 13, 22).

Regarding claim 23, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein the narrowband carrier or narrowband carriers outside the full bandwidth channel implement spreading (paragraph 3, 13, 22, 23).

Regarding claim 26, MCGOVERN discloses a method for decreasing required radio spectrum in a communication system using variable bandwidth, the method comprising: dividing radio frequencies of the communication system into a wideband channel radio frequency and narrowband channel radio frequencies (paragraph 11, 12,

21, 27, 28); and communicating user data using both the wideband channel radio frequency and the narrowband channel radio frequencies (paragraph 11, 12, 21, 27, 28). However, MCGOVERN does not expressly disclose wherein, when a device involved in the communication approaches a cell border, the device is handed to a narrowband channel radio frequency for communicating user data. DENT discloses wherein, when a device involved in the communication approaches a cell border, the device is handed to a narrowband channel radio frequency for communicating user data (col. 8, line 7-28; col. 9, line 9-40). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify MCGOVERN to include the use of narrowband frequencies when a device communication is located in cell boundary regions, as taught by DENT, since DENT state col. 9, line 31-40 that such a modification would improve soft handover in a mobile communication setting.

5. Claims 2 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCGOVERN et al (US 2002/0142777 A1) in view of DENT (US 5,668,637), and in further view of DONER (US 5,974,323).

Regarding claim 2, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses using a re-use factor that is applied to said narrowband channel radio frequencies (paragraph 23; minimum bandwidth of 12.5 or less is used when there are too many cell sites). However, MCGOVERN does not expressly disclose wherein a higher frequency re-use factor is applied to said narrowband channel radio frequencies. DONER discloses wherein a higher frequency re-use factor is applied to narrowband channel radio

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frequencies (abstract; col. 6, line 35-col. 7, line 4). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use a higher re-use factor for narrowband channel frequencies, as taught by DONER, overload conditions can be accommodated when traffic density approaches an overload condition.

Regarding claim 15, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. MCGOVERN further discloses wherein narrowband carriers are used in communication between the mobile station and base station (abstract; paragraph 22, 23). However, MCGOVERN does not expressly disclose wherein narrowband carriers are used in communication between the mobile station and base station to enable higher re-use of frequency channels without multiplying operator spectrum requirements. DONER discloses wherein narrowband carriers are used in communication between the mobile station and base station to enable higher re-use of frequency channels without multiplying operator spectrum requirements (abstract; col. 6, line 35-col. 7, line 4). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use a higher re-use factor for narrowband channel frequencies, as taught by DONER, overload conditions can be accommodated when traffic density approaches an overload condition.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over MCGOVERN et al (US 2002/0142777 A1) in view of DENT (US 5,668,637), and in further view of ROSENER et al (US 2002/0028655 A1).

Regarding claim 8, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. However, the combination of MCGOVERN and DENT does not expressly disclose wherein at least one of the communication cells includes a repeater configured to operate using both wideband channel radio frequencies and narrowband channel radio frequencies. ROSENER discloses wherein at least one of the communication cells includes a repeater configured to operate using both wideband channel radio frequencies and narrowband channel radio frequencies (paragraph 42, 95, 129). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to include a repeater with wideband and narrowband capabilities, as taught by ROSENER, as this allows the system the ability to adapt to various electromagnetic environments (see ROSENER paragraph 42).

7. Claims 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCGOVERN et al (US 2002/0142777 A1) in view of DENT (US 5,668,637), and in further view of (SCOTT 6, 049, 538).

Regarding claim 19, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. Although the combination of MCGOVERN and DENT teaches the use of a diversity transceiver and receiver (DENT - col. 6, line 40-67), the combination of MCGOVERN and DENT does not disclose wherein the mobile station utilizes multiple antennas. SCOTT discloses wherein the mobile station utilizes multiple antennas (col. 55, line 65-col. 56, line 17; diversity antenna). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was

made to modify the combination of MCGOVERN and DENT to include a diversity antenna, as taught by SCOTT, as the modification would provide diversity transmission/reception at a specified frequency using specific antennas.

Regarding claim 24, see the rejections of the parent claim concerning the subject matter this claim is dependent upon. Although the combination of MCGOVERN and DENT teaches the use of a diversity transceiver and receiver (DENT - col. 6, line 40-67), the combination of MCGOVERN and DENT does not disclose wherein the device further comprises multiple antennas. SCOTT discloses wherein the mobile station utilizes multiple antennas (col. 55, line 65-col. 56, line 17; diversity antenna). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to include a diversity antenna, as taught by SCOTT, as the modification would provide diversity transmission/reception at a specified frequency using specific antennas.

8. Claims 25, 27, 28, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over MCGOVERN et al (US 2002/0142777 A1) in view of DENT (US 5,668,637) and further in view of HALL (US 5,299,228).

Regarding claim 25, see the rejections of the parent claim concerning the subject matter this claim is dependent. However, the combination of MCGOVERN and DENT does not expressly disclose wherein user data is communicated using a narrowband channel radio frequency when a device involved in the communication is in an idle mode. HALL discloses wherein user data is communicated using a narrowband channel radio frequency when a device involved in the communication is in an idle

mode (abstract; col. 2, line 14-36). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use narrowband frequencies when a device is in idle mode, as taught by HALL, as HALL states that such a modification would minimize the power consumption of the mobile device (col. 2, line 28-36).

Regarding claim 27, see the rejections of the parent claim concerning the subject matter this claim is dependent. However, the combination of MCGOVERN and DENT does not expressly disclose wherein the narrowband frequency carrier bandwidths are further used in communication between the mobile station and the base station when the mobile station is in idle mode. HALL discloses wherein the narrowband frequency carrier bandwidths are further used in communication between the mobile station and the base station when the mobile station is in idle mode (abstract; col. 2, line 14-36). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use narrowband frequencies when a device is in idle mode, as taught by HALL, as HALL states that such a modification would minimize the power consumption of the mobile device (col. 2, line 28-36).

Regarding claim 28, see the rejections of the parent claim concerning the subject matter this claim is dependent. However, the combination of MCGOVERN and DENT does not expressly disclose wherein the wireless communication environment also implements narrowband bandwidth for communication when the device is in an idle mode. HALL discloses wherein the wireless communication environment also

implements narrowband bandwidth for communication when the device is in an idle mode (abstract; col. 2, line 14-36). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use narrowband frequencies when a device is in idle mode, as taught by HALL, as HALL states that such a modification would minimize the power consumption of the mobile device (col. 2, line 28-36).

Regarding claim 29, see the rejections of the parent claim concerning the subject matter this claim is dependent. However, the combination of MCGOVERN and DENT does not expressly disclose wherein the device is further handed to a narrowband channel radio frequency for communicating user data when the device is in an idle mode. HALL discloses wherein the device is further handed to a narrowband channel radio frequency for communicating user data when the device is in an idle mode (abstract; col. 2, line 14-36). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of MCGOVERN and DENT to use narrowband frequencies when a device is in idle mode, as taught by HALL, as HALL states that such a modification would minimize the power consumption of the mobile device (col. 2, line 28-36).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ariel Balaoing whose telephone number is (571) 272-7317. The examiner can normally be reached on Monday-Friday from 8:00 AM to 4:30 AM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ariel Balaoing – Art Unit 2617

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GEORGE ENG
SUPERVISORY PATENT EXAMINER